

REMARKS

Favorable reconsideration of the application is respectfully requested in light of the amendments and remarks herein.

Upon entry of this amendment, claims 1-33 will be pending. By this amendment, claims 1 and 26 have been amended. No new matter has been added.

Objection to Claim 26

In Section 1 of the Office Action, the Examiner has objected to claim 26 for informalities. Claim 26 has been amended to obviate the objection. Accordingly, it is respectfully requested that this objection be withdrawn.

§102 Rejection of Claims 1-23 and 26-33

In Section 3 of the Office Action, the Examiner has rejected claims 1-23 and 26-33 under 35 U.S.C. §102(b) as being anticipated by Etoh (U.S. Patent No. 6,289,314).

In the Background section of the Specification, it was disclosed that "detecting the orientation of a face of a human being" using conventional methods and systems is a very difficult task. *Page 2, lines 11-21 of the Specification.* To solve these difficulties, embodiments of the present invention provide for initially classifying sample data and repeatedly performing at least group feature detection, re-classification, and convergence detection until a certain condition is satisfied. In one aspect, the repetition of the process until there is convergence of the re-classified sample data improves the prospect of successfully detecting the orientation of the human face.

For example, the structure of a representative sample generating apparatus of independent claim 1, as presented herein, includes "group feature data detection means for detecting group feature data representing feature of sample data in each of said groups; distance detection means for detecting the distances between all of the sample data and the group feature data of each group; re-classification means for re-classifying all of said sample data into said plural groups based on said distances; convergence detection means for detecting whether or not the number of sample data classified into groups different from previous groups is converged as a result of re-classification by said re-classification means; and decision means for repeating the processing by said group feature data detection means, re-classification means and said convergence detection means until said convergence detection means has detected convergence, and for determining the group feature data of each group prevailing at the time of said convergence as detected by said convergence detection means as representative sample data of each group." *Claim 1 (emphasis added)*.

Etoh discloses using sample vectors and covariance matrix to get likelihood value needed for classification of the vectors into plural classes. Etoh also discloses judging means to optimize the distance between classes. However, Etoh fails to teach or suggest repeating group feature detection, re-classification, and convergence detection until a certain condition is satisfied, which would improve the prospect of successfully detecting the orientation of the human face. Further, Etoh's "teaching information" is different from our "representative sample data" in that Etoh fails to disclose means for calculating the distance between input data and each "teaching information" similar to the distance detection means for detecting the distances between all of the sample data and the group feature data of each group.

The limitations of independent claims 7-9 and 12-19 closely parallel, and are substantially similar to, the limitations disclosed in independent claim 1. Claims 2-6 and 10-11 depend from claims 1 and 9, respectively. Accordingly, claims 1-19 should be allowable.

Claim 20 discloses a "coefficient data generating apparatus for generating a coefficient data set adapted for generating sample feature data from new sample data not having sample feature data, based on a database in which there are pre-stored said sample feature data and sample data associated with said sample feature data, said apparatus comprising: classification means for classifying said sample data into a plurality of classes, based on the relation thereof with representative sample data which is set to each classification and which is associated with the sample feature data; means for generating, for each class, a normal equation having the values of the sample feature data and the sample data as previously known data and having coefficient data as unknown data; and coefficient data generating means for solving said normal equation for each class to generate said coefficient data set for each class." *Claim 20 (emphasis added).*

Regarding claim 20, the Examiner indicates that Etoh teaches a coefficient data generating apparatus (col. 3, lines 30-40; col. 4, lines 57-61; FIG. 1, 114, 115, 119), classification means (col. 3, lines 20-25, 44-46), and means for generating a normal equation (col. 4, eq. 4, and col. 5, lines 13-67). However, it seems Etoh fails to teach or suggest the coefficient data generating apparatus in the cited sections and figures. Although Kronecker's delta mentioned in the cited sections can be considered as coefficients, these coefficients are different from the coefficients generated by the coefficient data generating means of claim 20, since Kronecker's delta coefficients are known prior to the classification. The coefficients of

claim 20 are obtained as a result of re-classification. Further, Etoh fails to teach or suggest means for generating a normal equation. Equation 4 discloses an example of a form of adding the distance of the difference of sample vector and mean vector normalized by the covariance matrix, which is used to evaluate the likelihood of it belonging to a class. Thus, the disclosed normalized vectors are different from the normal equation of claim 20.

The limitations of independent claims 21 and 22 closely parallel, and are substantially similar to, the limitations disclosed in independent claim 20. Accordingly, claims 20-22 should be allowable.

Claim 23 discloses a "sample feature data generating apparatus comprising: distance detection means for detecting distance between input sample data and each representative sample data generated previously for each of a plurality of groups; classification means for classifying said input sample data into one of said classes, based on the distances of said input sample data from representative sample data of said plural groups; and sample feature data generating means for generating sample feature data representing the feature of said input sample data in accordance with a system pre-set for each class." *Claim 23 (emphasis added).*

Regarding claim 23, the representative sample data recited in the claim is different from the teacher data disclosed in Etoh. For example, the representative sample data of claim 23 can be used to perform image matching with input data. However, it seems that teacher data in Etoh is used to change each class data. Thus, it cannot be said that claim 23 is anticipated by Etoh.

The limitations of independent claims 29 and 30 closely parallel, and are substantially similar to, the limitations disclosed in independent claim 23. Claims 24-28 depend from

claim 23. Accordingly, claims 23-30 should be allowable. Further, independent claims 31-33 combine the limitations of claims 1 and 23. Accordingly, claims 31-33 should also be allowable.

Based on the foregoing discussion, it is submitted that claims 1-23 and 26-33 are not anticipated by the teachings of Etoh. Accordingly, it is submitted that the Examiner's rejection of claims 1-23 and 26-33 based upon 35 U.S.C. §102(b) has been overcome by the present remarks and withdrawal thereof is respectfully requested.

§103 Rejection of Claims 24 and 25

In Section 5 of the Office Action, the Examiner has rejected claims 24 and 25 under 35 U.S.C. §103(a) as being unpatentable over Etoh, in view of Kondo (U.S. Patent No. 5,966,183).

Since claims 24 and 25 depend from independent claim 23, claims 24 and 25 should be allowable over Etoh, as discussed above. With respect to Kondo, the Examiner indicates that although "Etoh does not clearly indicate a prediction equation generation means for generating a prediction equation", Kondo teaches generating the prediction equation. Thus, it seems that Kondo was cited merely for the limitation of a prediction equation generation means. Therefore, Etoh and Kondo, individually or in combination, fail to teach or suggest all the limitations of claim 23. Accordingly, Etoh and Kondo, individually or in combination, fails to teach or suggest all the limitations of claims 24 and 25.

Based on the foregoing discussion, it is submitted that claims 24 and 25 are not rendered obvious by the combined teachings of Etoh and Kondo. Accordingly, it is submitted

that the Examiner's rejection of claims 24 and 25 based upon 35 U.S.C. §103(a) has been overcome by the present remarks and withdrawal thereof is respectfully requested.

CONCLUSION

In view of the foregoing, entry of this amendment, and the allowance of this application with claims 1-33 are respectfully solicited.

In regard to the claims amended herein and throughout the prosecution of this application, it is submitted that these claims, as originally presented, were patentably distinct over the prior art of record, and that these claims were in full compliance with the requirements of 35 U.S.C. §112. Changes that have been made to these claims were not made for the purpose of patentability within the meaning of 35 U.S.C. §§101, 102, 103 or 112. Rather, these changes were made simply for clarification and to round out the scope of protection to which Applicant is entitled.

In the event that additional cooperation in this case may be helpful to complete its prosecution, the Examiner is cordially invited to contact Applicant's representative at the telephone number written below.

PATENT
Appl. No. 09/700,168
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The Commissioner is hereby authorized to charge any insufficient fees or credit any overpayment associated with the above-identified application to Deposit Account 50-0320.

Respectfully submitted,

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